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ABSTRACT

This paper proposes a two-pronged approach for examining an educational program's "quality of fit." The American Association of School Administrators' (AASA's) Curriculum Management Audit for quality indicators is reviewed, using the Downey Quality Fit Framework and Deming's 4 areas of profound knowledge and 14 points. The purpose is to examine how the premises of the curriculum-management audit and the ideas of the quality movement align themselves. Compared with Downey's framework and Deming's areas of profound knowledge, findings demonstrate a strong alignment in the areas of purpose and structure, but little in the area of relationships. Compared with Deming's areas of profound knowledge and 14 points, there is considerable overlap of Deming's principles and the curriculum-audit standards. If the audit is used as a vehicle to transform a school system into a quality school system, top-level management should: (1) drive out fear; (2) break down barriers between staff areas; (3) eliminate slogans, exhortations, and targets for the work force; and (4) eliminate numerical quotas for the work force and numerical goals for management. In summary, although there is significant overlap between the curriculum-audit and quality-management principles in some areas, other areas are implicitly addressed in the context of the audit. Seven tables are included. (Contains 22 references.) (LMI)

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Introduction

The word "quality" is sweeping the educational world. Many educators have been quick to label their current programs "quality" without careful examination of the quality movement to determine if their idea or approach has a quality fit. Unfortunately, some exceptionally well-thought-out ideas on quality, ideas which could help transform education, may be lost by educators who jump on the quality bandwagon without careful study.

The desire to be "in" could destroy a major opportunity for the field of education to transform itself. At the same time, other educators are engaged in appropriate processes and approaches, which emerge from quality principles, but could be overlooked in the rush for everyone to bring attention to programs which may not fit.

The authors propose that any educational program be examined for its quality fit. They present herein a two-pronged approach as an important first step for the education community to consider. The authors briefly explore some of the basic premises of the quality movement, as synthesized in Downey's Quality Fit Framework (1992). The framework incorporates many of the ideas of Dr. W. Edwards Deming. Deming is the man that helped the Japanese to turn their economy around after World War II. He was invited to Japan to teach business leaders about quality; he taught them about a system and how to optimize it. He has been working with American industry for decades and recently the educational community has begun to listen.

The fact that this analysis is a first step only cannot be overemphasized. Deming's principles and their application emerge from theory and cannot

necessarily be copied for successful practice from one institution to another. To put it in Deming's words, "to copy an example of success, without understanding it with the aid of theory, may lead to disaster" (March-April, 1992, p. 70).

The authors also examine the American Association of School Administrator's (AASA's) Curriculum Management Audit, developed by the accounting firm of Peat, Marwick, and Mitchell in cooperation with Fenwick W. English, professor of educational administration at the University of Kentucky. The audit is now prominent in the educational sector as a vehicle for examining the quality of curriculum management in school systems.

The authors then, in a two-pronged approach, review the audit for quality indicators. First, there is an overlay of the Downey Quality Fit Framework and the standards of the curriculum audit. Second, there is the overlay of Deming's four areas of Profound Knowledge and his 14 points with the curriculum audit. The purpose of this approach is to answer the following question: How do the premises of the curriculum management audit and the ideas of the quality movement align themselves?

The purpose of the audit is not to look directly at concepts of quality, as presented by Deming and others, but, instead, at the rationality of a system. It should be noted that the curriculum audit and quality premises have different purposes. Quality premises apply to the design of the work, whereas the curriculum audit is a descriptive evaluation of the work design and becomes prescriptive only through its recommendations (English, 1992). This article offers a particular view of a rational school system as a basis for applying Profound Knowledge and for surfacing the questions that school personnel must ask themselves as they consider the application of quality to school systems.

Quality has been defined in many ways. The American Society for Quality Control defines it as "the totality of features and characteristics of a product or service that bear on its ability to satisfy a stated or implied need" (Johnson and Winchell, 1990). Deming defines quality as "the meeting and exceeding of customer's needs--and then continual improvement (of the product or service)" (Deming, 1992f).

Downey's Quality Fit Framework

The first prong of the approach in examination of the curriculum audit is to use the Quality Fit Framework devised by Downey. A review of the literature on quality reveals both similarities and differences by the major thinkers and gurus of the quality movement. School systems should focus on similarities and not get caught up in debating these differences. There is concern that educators are getting bogged down in debate on the differences and not moving forward in what needs to be a major overhaul of the education system.

There is significant agreement about the many principles, which provide ample richness of thought for action. Downey has identified eighteen common core premises providing a framework which a system can use to move toward becoming a full fledged quality system. These premises incorporate the thinking of Deming (1982, 1991, 1992); Juran (from Deming, 1982); Joiner (1985); Sashkin (1991), and other "quality experts'" ideas.

Downey has structured the premises around three powerful leverage points in every work setting, which Marvin R. Weisbord identified in his book entitled Productive Workplaces (1987). The three leverage points which can be used to "turn anxiety into energy are purposes, structure, and relationships" (p. 258). Weisbord states that:

- "Purpose or mission is the business we are in. It embodies future vision on which security and meaning depend.

- Structure is defined as 'who gets to do what' and this affects self-esteem, dignity, and learning.

- Relationships are defined as the 'connections with co-workers that let us feel whole--require cooperation across lines of hierarchy, function, class, race and gender."

The eighteen core premises are interrelated and must be integrated in a systematic way. The Quality Fit Framework and its premises are briefly described as follows:

Purpose

- Focuses on the customer with the aim of the organization built around exceeding both internal and external customers' needs and desires.

- Provides for a meaningful shared mission/aim/purpose which binds people together around a common identity and sense of destiny.

- Has a sense of mission, constancy of purpose.

- Believes in continual improvement toward the aim of the organization with ever higher standards or benchmarks toward that mission.

Structure

- Believes in and acts as a systemic organizational structure in which organizational relationships are orchestrated.

- Focuses on optimization in the system in which departments or units are encouraged to work together in a cooperative, rather than a competitive, fragmented way.

- Is a rational organization using Profound Knowledge founded on prediction, based on theory and reason.

- Has an integrated webbed structure rather than a hierarchical structure. Works on an ad hoc basis rather than a bureaucratic one with integrated cross functional teams with a collective inquiry strategy.

- Focuses on the processes and various quality checkpoints including supply points, incoming quality, process, distribution, and user, to increase quality.

- Uses a data orientation for planning and as feedback to solve problems for continuous improvement of the process toward ever-increasing efficiency and effectiveness.

- Has an understanding of variation and uses the information for improvement of processes.

Relationships

- Mobilizes the workers to change the process.

- Has workers who collaboratively, cooperatively work in an inter-dependent way to carry out tasks.

- Provides for an organizational culture of shared values and beliefs about how to work together in an environment of fairness, openness, trust, clear standards, dignity of others.

- Has leadership that understands how people are motivated and that moves employees toward intrinsic motivation.

- Recognizes that most failures are attributable to faults in the system rather than the employee and focuses on process improvement rather than individual accountability.

- Establishes a community of learners (internal and external customers) and learning teams who are provided education and training on a continual basis in an attempt to improve the system.

- Provides for constant communication and feedback within and between units of the organization.

Deming's Profound Knowledge

Deming developed a theory of Profound Knowledge, which undergirds his principles about quality management and is comprised of four interacting parts. Profound Knowledge helps us make the shift from our current paradigm to a new one. This shift is necessary because America cannot increase its productivity within the old paradigms in business and education. The four parts are:

1. Appreciation of a System

Deming describes a system as "an inter-connected complex of functionally related components that work together to try to accomplish the aim of the system." He states that "management of a system therefore requires knowledge of the interrelationships between all the components within the system and of the people that work in it." He further states that "optimization is a process of orchestrating the efforts of all components toward achievement of the stated aim. For optimization, a system must be managed. Management's responsibility is to strive toward optimization of the system through time" (1992a, p. 62-63).

"The obligation of any component" (of the system), says Deming, "is to contribute its best to the system, not to maximize its own production, profit, or sales, nor any other competitive measure. Some components may operate at a loss to themselves, in order to optimize the whole system, including the components that take a loss" (1992a, p. 66).

2. Knowledge of Psychology

Deming's second critical area of Profound Knowledge is psychology. He says that managers must recognize that people are different from one another and learn in different ways and at different speeds. Managers must optimize the abilities and talents of each individual, while managing the interactions between them. It is also important that they understand how people are motivated and

that they know how to reinforce intrinsic motivation. Monetary and other rewards can destroy intrinsic motivation (1991; 1992a).

3. Knowledge of Variation

Deming illustrates that most variation of a product or a service is attributable to the system in which it is produced. Without knowing the limits of variation, one cannot know if observable differences are predictable, or common, causes, attributable to the system, or special causes, attributable to an individual situation or person (1991; 1992a).

4. Theory of Knowledge

Deming states that "management in any form is prediction" (1992a, p. 69). Rational prediction is based on theory and builds knowledge as the theory is revised and extended based on a comparison of predictions to results. He told one of the authors, "Experience teaches nothing without theory." Without theory, therefore, there is no learning.

Deming's Fourteen Points

Deming's Fourteen Points, or principles for transformation of western management, are based on Profound Knowledge. According to Deming, they are natural applications of the system of Profound Knowledge (1992a). These segments cannot be separated. Variation, psychology, and the theory of knowledge are generic to the transformation of any system. It is the understanding of a specific system in which we operate that is necessary to apply the principles necessary to achieve quality.

Deming's Fourteen Points are as follows:

1. "Create constancy of purpose for improvement of product and service.
2. Adopt the new philosophy.

3. Cease dependence on mass inspection to achieve quality.
4. End the practice of awarding business on the basis of price tag alone. Instead, minimize total cost by working with a single supplier.
5. Improve constantly and forever every process for planning, production, and service.
6. Institute training on the job.
7. Adopt and institute leadership.
8. Drive out fear.
9. Break down barriers between staff areas.
10. Eliminate slogans, exhortations, and targets for the work force.
11. Eliminate numerical quotas for the work force and numerical goals for management.
12. Break down barriers that rob people of pride of workmanship. Eliminate the annual rating or merit system.
13. Institute a vigorous program of training and self-improvement for everyone.
14. Put everybody in the company to work to accomplish the transformation" (Deming, 1982).

The Curriculum Audit

The Curriculum Audit, offered through AASA in cooperation with Fenwick English, is an objective, third-party examination of the curriculum design and delivery system of a school or school district. Curriculum policy and the system in which curriculum functions are analyzed by the audit team. Specific recommendations are developed to improve those functions and to enhance school effectiveness.

The Curriculum Audit is a tool that enables one to look at a school system in terms of its functionally related components as they pertain to the design and delivery of curriculum. Although schools are usually grouped together in what are called "school systems," it has been the authors' experience that they often operate individually, rather than as systems.

The Curriculum Audit is governed by similar principles, procedures, and standards as the financial audit. The audit team uses documents, interviews, and site visits as major sources of data to determine the extent to which there is congruence among the written, taught, and tested curricula. The curriculum audit process is probably the single most powerful tool yet created for the improvement of curriculum.

The five standards of the curriculum audit, and the criteria against which schools are evaluated with the audit process, illustrate the relationship of the functionally related components of school systems. Table 1 shows the five standards and corresponding criteria.

Table 1 The Five Curriculum Management Audit Standards		
Standard Number	Standard Title	Standard The school system:
One	Control	...demonstrates its control of resources, programs, and personnel
Two	Direction	...establishes clear and valid objectives for students
Three	Connectivity and Equity	...demonstrates internal connectivity and rational equity in its program development and implementation
Four	Feedback	...uses the results from district-designed or adopted assessments to adjust, improve, or terminate ineffective practices or programs
Five	Productivity	...has improved productivity

A Logical Connection and the Overlay of Quality

The authors are lead auditors for the National Curriculum Audit Center of the American Association of School Administrators. They are also trainers in the curriculum audit process. They have both been involved over the past four years in a study of quality. One has studied principles presented by Deming and other experts on quality while the other has studied as a "Deming purist." As school personnel attempt to understand how quality relates to education, it is important that they understand school districts as systems.

Both Deming and English offer philosophies of management. How are these philosophies alike and how are they different? The specific questions the authors will raise are: (1) To what extent do the concepts of the curriculum audit align with the Quality Fit Framework and Deming's areas of Profound Knowledge? (2) To what extent do Deming's Profound Knowledge and Fourteen Points align with

the audit standards and their criteria? and (3) What implications might the application of quality management have on the recommendations auditors make to school districts?

First Prong: Quality Fit Framework and Profound Knowledge Overlay

The first comparison is how the curriculum audit and quality ideas are aligned with respect to the eighteen quality premises outlined earlier, as well as Deming's areas of Profound Knowledge:

- Customer Focus: Both bring the concept of customer focus. In the quality movement, the aim of the organization is to meet and exceed the needs of the customer. In the curriculum audit, standard five focuses on the need for increased student productivity as the planned purpose of all interventions in the system. The student is the ultimate customer in public schools; the product of the schools is learning. English states, "Work measurement in curriculum evaluation consists of two foci: (1) a determination of the results of the work of the clients (learners), and (2) a determination of the results of the work upon the system" (English, 1987, p. 285).

- Shared Mission: Both bring the concept of a mission or purpose of the organization. Although the curriculum audit does not call for a shared mission, it does identify mission as an ingredient of long-range planning.

  Of a shared mission, Senge (1990) states, "If any one idea about leadership has inspired organizations...it's the capacity to hold a shared picture of

the future we work to create. One is hard pressed to think of any organization that has sustained some measure of greatness in the absence of goals, values, and missions that become deeply shared throughout the organization" (p. 9).

- Constancy of purpose: Both have a belief in constancy of purpose.

The first of Deming's Fourteen Points is to create constancy of purpose. He states, "Problems of the future command first and foremost constancy of purpose and dedication to improvement..." (Deming, 1982, p. 25).

English (1987) states, "Breakthroughs do not happen in organizations without purposes...and purpose(ful) work design...the insights are most powerful in purposive environments because they make a difference and can lead to changes in internal processes and new kinds of outcomes. Organizations without purposes...are not in control of themselves" (p. 205).

- Continual improvement: Both Deming and English embrace the concept of continual improvement for increasing efficiency and effectiveness.

Deming, in talking about continual improvement, indicates that every worker needs to ask the question every day: "Is there continual improvement in methods to understand better each new customer's needs?" (Deming, 1982, p. 50).

English states: "At the heart of the curriculum audit is the idea that quality control should be functional in a school system. That means that there are clear goals or objectives; human activity is directed toward accomplishing them; feedback is gathered about system performance (internal and external); and such data are used to examine current levels of performance in order to change things to subsequently improve performance" (1992, p. 107). English says that when this concept is repeated over time, there should be a overall, systematic improvement.

Standard Five of the curriculum audit includes the concept of continual improvement. "Productivity is simply the relationship between all of the inputs and the cost of obtaining any given level of outputs" (English, 1988. p. 66). "A school district meeting this standard of the audit is able to demonstrate consistent pupil outcomes, even in the face of declining resources. Improved productivity results when a school system is able to create a more consistent level of congruence between the major variables involved in achieving better results and in controlling costs" (p. 132).

Structure

- Systemic organizational structure: Both are based on the concept of systems thinking.

One of Deming's four areas of Profound Knowledge is the appreciation of a system, as described earlier in this article. Deming indicates that management must understand systems and orchestrate all the integrated parts toward the aim of the organization.

A premise of the curriculum audit is that "curriculum has two essential functions. The first is to create a system maximizing resources within that system (articulation and coordination) and thereby maximizing results (student learning)" (English, 1987, p. 285).

- Optimization: Both embrace the concept of optimization. Deming indicates that a leader is expected to understand systems and to manage the interaction of the components of the system for its optimization.

English states that an expectation of effective curriculum management is that "the system is behaving as a system, and will be able to optimize its resources through optimal operations" (1987, p. 286).

- Rational Organization: Both embrace the concept of rationality. Deming's theory of knowledge has as its underpinnings that the organization should be rational. An organization that is rational requires prediction, observation, and theory. It is management's responsibility to look ahead, predict, change the product, keep the company in operation...management in any form is prediction; rational prediction is based on theory and reason (Deming, 1991). In a document on Theory of Knowledge, Deming (1992a) writes, "Any rational plan, however simple, requires prediction concerning conditions, behavior, comparison of performance of each of two procedures or materials" (p. 8).

English states, "A rational system is one in which the people and the activities are directed by goals and objectives (Silver, 1983, p. 77). English also states that "curriculum audits operate on the premise that

there is system rationality present and that it is possible to improve the relationship between internal activities and external performance, however measured" (English, 1992, p. 106).

English also says "a rational organization develops goals, translates them into activities which are congruent with the goals, portions its resources based on goal priorities, and translates both into tangible jobs to be performed and subsequently evaluated. Based upon feedback obtained from evaluation, the cycle is repeated until the desired results are obtained at the lowest possible cost" (1988, p. 329).

- Integrated webbed structure: Only the quality movement has this as a concept.

The concept of an integrated webbed structure, rather than a hierarchical structure, is implied by many quality experts when systems thinking is discussed (Senge, 1992). This type of structure often uses cross functional teams for critical decisions. Individuals bear equal power and authority in such situations.

The curriculum audit does examine the formal organizational structure, as depicted by a table of organization, but a webbed integrated structure is not an explicit criterion. What is examined is whether the system is functioning well under whatever organizational structure it has and whether or not that structure impedes the system's output.

- Process focus: Both direct the concept of focus on the process, rather than the product, but recognize that the reason for this is to improve the product.

One of Deming's four areas of Profound Knowledge is that leaders must have an understanding of variation. This information is useful to determine which sources of variation are caused by the system and which are attributable to a specific situation or person.

English states that "quality control becomes operational when adjustments are made by the worker (to the process) to attain a closer match to the work standard based upon (formative) feedback data. This is the dynamic and fluid part of quality control" (1992, p. 45).

- Data orientation: Both the quality movement and the curriculum audit are data-oriented.

The quality movement has a high profile in the area of using a data orientation to solve problems for continual improvement of the process toward ever-increasing efficiency and effectiveness. Deming's Plan-Do-Study-Act (PDSA) cycle is one example of this emphasis.

A critical standard in the curriculum audit is the feedback standard. As English states, "Too often, curriculum auditors find that school districts are 'data rich' but 'information poor.' Most school systems have more data than they know how to use. Data become information when their utility has

been established and someone finds them functional in terms of being able to engage in decision making based upon them" (English, 1992).

- Variation: Both include the concept of variation.

One of Deming's four part of Profound Knowledge is having some knowledge of the theory of variation. He states, "Some understanding of variation, including appreciation of a stable system, and some understanding of special causes and common causes of variation, is essential for management of a system, including leadership of people...variation there will always be, between people, in output, in service, in product" (Deming, 1992a).

English (1992b) talks about reducing "in system" sources of variation, which includes aligning curriculum and building consistency into documents which guide the work. He also talks a third source of variation, the student. The third standard's equity criterion focuses resources on areas of greatest need. Effective instruction actually increases variation. Thus, variation, in that respect, should lead to differential resource allocation.

Relationships

- Mobilizes the workers: Only the quality movement describes this as a concept.

Joiner states that in many cases a difficult but expected aspect of quality "is to create an environment of ALL ONE TEAM...everyone throughout the organization must work together to improve processes..." (19^5, p.5).

Deming's fourteenth point is to put everybody in the company to work to accomplish the transformation (1982, p. 86).

There is no explicit expectation in the curriculum audit regarding the need for all workers to work on the processes. This decision is left to the system. However, there is an implicit standard that everyone should pull together to improve the instructional program.

- Collaborative workers: Only the quality movement has this concept.

One of Deming's Fourteen Points is to break down barriers between staff. There are two areas in the curriculum audit where workers are to be involved. First, one ingredient of long range planning is involvement of stakeholders and, second, employees must to give input to the budget process. Not having involvement, however, would not keep a district from meeting the standard.

- Shared values and beliefs: Only the quality movement has this concept.

Sashkin, in writing about the quality movement, indicates that one of the more difficult parts in understanding and applying quality ideas is the "creating, nurturing, and sustaining a culture based on the quality movement beliefs...values and beliefs must be embedded and operate with that culture" (1991, pp. 60-61).

There are no direct statements regarding the need for shared values and beliefs in the audit standards. Again, this is an implicit standard, and often becomes a finding when a system is dysfunctional.

- Leaders who understand people's motivations: Only the quality movement has this as an explicit concept.

This is one of the points Deming stresses often. It shows up several times in his Fourteen Points: Drive out fear; cease dependence on mass inspection; eliminate slogans, exhortations, and targets for the work force; eliminate numerical quotas; and break down barriers that rob people of pride of workmanship.

Although the audit includes no criterion in this area, during interviews, auditors seek to understand motivation in the context of the audit and its impact on productivity.

- Most failures are faults in the system. Only the quality movement has this as an explicit premise.

Deming (1982) states, "The supposition is prevalent the world over that there would be no problems in production or in service if only our production workers would do their jobs in the way that they were taught. Pleasant dreams. The workers are handicapped by the system, and the system belongs to management. It was Dr. Joseph M. Juran who pointed

out long ago that most of the possibilities for improvement lie in actions on the system..." (p. 134).

The audit examines work structures and deals with this concept implicitly (English, 1992).

- Community of learners: Only the quality movement has this concept.

Deming (1982) identifies a worker's education and training as vital to the well-being of the employee. This shows up in two of his Fourteen Points.

The curriculum audit does examine staff development endeavors as a vehicle for imparting consistency (Standard Three) in the delivery of the curriculum. However, a system need not have on-going staff development efforts to meet the standard, if the auditors find no problems in connectivity, consistency, and equity in the system.

- Ongoing communication and feedback: Both the quality movement and the audit include communication as an explicit expectation. However, with respect to ongoing communication and feedback, the audit has no implicit standard.

Joiner (1985) points out that ongoing communication between managers and workers is critical to improvement of the process. In the curriculum audit, there is no criterion on communication, although it is expected that in budget preparation, as well as in planning, stakeholders are involved.

Communication is addressed by the audit in the policy criterion on clear communication and the third standard criterion regarding clearly explaining the curriculum to members of the teaching staff and building-level administrators. An implicit expectation is that communication are built into the system to make it more productive.

Summary of the First Prong Analysis

When the overlay of the audit and quality premises is examined using Downey's framework and Deming's areas of Profound Knowledge, one can see that there is strong alignment in the areas of purpose and structure and there is little alignment in the area of relationships.

In analyzing the audit with respect to purpose, there is client focus, mission expectations, strong constancy of purpose, and continual improvement beliefs. Less match occurs with respect to shared mission.

The strongest match is in the area of structure, especially in the areas of systemic organizational structure, optimization, rationality, and data orientation. There is fairly strong alignment in the areas of process focus and knowledge of variation. The weakest linkage is in the area of integrated webbed structure.

As mentioned earlier, the area where there is least alignment is relationships and Deming's focus on knowledge of psychology. Organizational psychology is implicit throughout the audit. There are a few explicit statements on involvement or participation in some areas of curriculum management and decision making and the need for staff development, which could link to community of learners. For the most part, the audit does not address mobilizing the workers, working in collaborative ways, or fostering shared values and beliefs. There is no explicit alignment in the areas of leadership, understanding

people's motivation, and understanding variation as it relates to the failures of systems versus individuals.

Second Prong: Deming's Profound Knowledge and Fourteen Points Overlay

The second prong of the "quality of fit" approach is to compare an approach or strategy to Deming's Profound Knowledge and his 14 points. For ease of understanding, the standards for the audit and their criteria are shown one by one in tabular form in relationship to those of Deming's 14 points that relate to each standard. The tables offer a starting point for discussion, which goes beyond the standards, criteria, and 14 points to the extent the authors are knowledgeable about the audit process and Deming's principles. Sources of information also include conversations with Deming about many of these ideas and various of his presentations during 1992.

Standard 1: Control

Standard One of the curriculum audit concerns control. It establishes the framework and responsibility for curriculum design and delivery. The standard concerns the development of policies, the planning function, and the organizational structure of the school system.

According to Deming, "accountability for quality rests with top management (1992a)." Table 2 shows Standard One with its criteria and those of Deming's Fourteen Points that have implications for the standard. Deming's first point, **create constancy** of **purpose** for **improvement of product and service**, has implications for the way in which policy is structured and for the relationships within the school system, from the board and superintendent to the classroom t acher.

Deming's second point, **adopt the new philosophy**, relates to board definition and adoption of curriculum, development of policies, and a mechanism to control change and innovation within the school system. In his book, Out of the Crisis, Deming's discussion of this second point includes the stabilization of top level management. The auditors recommend that a district that has had an extraordinary amount of turnover of superintendents and other key personnel stabilize its top level management. Stability increases the likelihood of constancy of purpose.

Deming's fifth point, **improve constantly and forever every process for planning, production, and service** has implications for the way in which policies might be developed and how a long range plan might be created. He is very clear about the necessity of long-term planning. "One does not achieve long-term goals by short-term thinking," Deming says. The curriculum audit calls for planning as an important aspect of control for the future. The point would further suggest that any district's plan provide for continual improvement of the system, using the plan-do-study-act (PDSA) cycle (1992a). This point also relates to the final criterion of the standard, which pertains to a mechanism for change and innovation. That mechanism should not be fixed and static but, rather, should provide for continual improvement.

The seventh point, **adopt and institute leadership**, means that the job of management is to lead, rather than supervise. In order to do so, they must understand curriculum and instruction. "Leaders must know the work they supervise," Deming tells us (1986). Often the auditors find that school principals are building managers, rather than instructional leaders, more concerned with the smooth operation of facilities than with teaching and learning, and this is cited in audit reports.

This criterion also pertains to the structure of the school system. In his lectures, Deming says that the typical pyramid-shaped table of organization is useful only in illustrating who reports to whom. He also says that the pyramid contributes to fragmentation of the organization. He recommends making a flow diagram of the work, "which is actually an organization chart" (1992c). He says we need to see a "cat-walk" between the elements of the diagram (1992d). The auditors make recommendations concerning a school system's table of organization when necessary. Deming's advice would suggest that the auditors recommend flow diagrams to school districts so they might better understand the work. However, because this is a design intervention, it is not seen as appropriate to the audit (English, 1992).

Although site-based management is not specifically addressed by the standards, the audit bias is concerned with the problem of sub-optimization. Such sub-optimization is "accentuated in organizations where they are decentralized and where central authorities lack the capacity to deal with sub-optimization. As a result, site-based management, if not balanced with a tightly coupled curriculum system-wide, can often become a fragmented system" (English, 1992b). Deming agrees. He discusses a company whose president made people in the plants responsible for their own product and its quality. The result: the quality went down.

Table 2
Standard One: Control and Deming's Points

Audit Criterion	Deming's Points
• A curriculum that is centrally defined and adopted by the board of education	1. Create constancy of purpose for improvement of product and service 2. Adopt the new philosophy
• A clear set of policies that establish an operational framework for management	1. Create constancy of purpose for improvement of product and service 5. Improve constantly and forever every process for planning, production, and service
• A clear set of policies that reflect state requirements and local program goals and the necessity to use achievement data to improve school system operations	1. Create constancy of purpose for improvement of product and service 2. Adopt the new philosophy
• A functional administrative structure that facilitates the design and delivery of the district's curriculum	7. Adopt and institute leadership
• Documentation of school board and central office planning for the attainment of goals over time	5. Improve constantly and forever every process for planning, production, and service 7. Adopt and institute leadership
• A direct, uninterrupted line of authority from school board, superintendent, and other central office officials to principals and classroom teachers	1. Create constancy of purpose for improvement of product and service
A clear mechanism to control change and innovation within the school system	1. Create constancy of purpose for improvement of product and service 2. Adopt the new philosophy 5. Improve constancy of purpose for improvement of product and service 7. Adopt and institute leadership

Standard 2: Direction

Standard Two of the curriculum audit is called the direction standard. This standard is concerned with written goals and objectives; a clear sense of priorities and record of explicit direction from the board and superintendent; concentration of resources on priority targets; and demonstration of local control (see Table 3).

Deming's first point, **create constancy of purpose for improvement of product and service**, and his second point, **adopt and institute leadership**, both relate to the first three criteria, regarding goals and objectives and direction from the administrative staff. Deming says, "Aim at the target every time," (1992a) and illustrates the need to do so in his funnel experiment. If school systems are clear about their aim, or mission, they should not adjust their direction when they see variation in their efforts, but, rather, should continue to aim at the target.

Deming's seventh point, **adopt and institute leadership**, relates to demonstration of local control. Leadership must be assumed at the local level, regardless of state, national, or other conflicting or confounding factors in order for school systems to move forward in efforts to transform.

Deming talks about meeting the needs of the customer, which ties in well with these criteria. Resources are easy to place when one has a clear understanding of mission and continual sense of purpose. If the focus of resources is on the process for reaching the desired mission, Deming's third point, **cease dependence on mass inspection** could link with this standard as well. Rather than use inspection at the end of the process, grade 3, 9, or 12, to determine effectiveness, ongoing data should be used to assess processes and

resources and given quickly to those areas in need before the end inspection. And the process would be unending--constantly improving (fifth point).

Table 3 Standard Two: Direction and Deming's Points	
Audit Criterion	**Deming's Points**
• A clearly established, distictwide set of goals and objectives adopted by the Board of Education	1. Create constancy of purpose for improvement of product and service 7. Adopt and institute leadership
• Objectives which set the framework for operation of the district and its sense of priorities	1. Create constancy of purpose for improvement of product and service 7. Adopt and institute leadership
• Provision of explicit direction for the superintendent and professional staff	1. Create constancy of purpose for improvement of product and service 7. Adopt and institute leadership
• Demonstration of local control	1. Create constancy of purpose for improvement of product and service

Standard Three: Connectivity and Equity

Standard Three, the connectivity and equity standard, concerns the school district's demonstration of internal connectivity, consistency, and rational equity in its program development and implementation. Table 4 shows the Standard Three criteria and the related points of Deming. Although Deming does not have a corresponding point concerning equity, in his lectures, he says, "If we don't keep equity in the forefront, we will destroy our society." He also says that "efficiency must be subsumed to equity" (Deming, 1992a).

Deming's first point, **create constancy of purpose for improvement of product and service**, relates to the criteria concerning internal connections in the organization, consistency, allocation of resources, and teacher and administrator responsiveness to board policies. The audit process clearly establishes the linkages that must be present for policy to be connected with what transpires in the classroom.

Deming's second point, **adopt the new philosophy**, relates to allocation of resources to areas of greatest need. Customer focus is at the heart of Deming's philosophy, whether the customers are internal or external to the system. If everyone adopts the new philosophy, then the system is moving toward assuring quality in its products and services as they pertain to customer needs.

Deming's seventh point, **adopt and institute leadership**, relates to the monitoring of curriculum by central office personnel. In order for there to be consistency from school to school, there must be shared system-wide responsibility.

Deming's sixth and thirteenth points, concerning job training and self improvement, relate to the criterion for specific training programs to enhance curriculum implementation. Deming stresses the importance of training the

worker to better perform the job. The audit proposes focused professional growth experiences as determined by the needs of the school system.

Deming also believes the organization should provide opportunities for ongoing educational experiences for the worker. He says we shouldn't decide what training is inappropriate. "Who knows what study is connected with your work?" Nobody knows. There's no such thing; that's nonsense. If someone wants to study the theory of music, help him study it; nobody knows what's connected with the work" (1992a).

Deming's fourteenth point, **put everybody in the company to work to accomplish the transformation**, relates to the criterion for clearly explaining the curriculum to members of the teaching staff and building-level administrators. Only if everyone understands the work can they work together to transform a school system.

Table 4 Standard Three: Connectivity and Equity and Deming's Points	
Audit Criterion	**Deming's Points**
• Documents/sources that reveal internal connection at different levels in the organization	1. Create constancy of purpose for improvement of product and service
• Predictable consistency through a coherent rationale for content delineation within the curriculum	1. Create constancy of purpose for improvement of product and service
• Equity of curriculum, course access, and opportunity	*
• Allocation of resource flow to areas of greatest need	1. Create constancy of purpose for improvement of product and service 2. Adopt the new philosophy
• A curriculum that is clearly explained to members of the teaching staff and building-level administrators	14. Put everybody in the company to work to accomplish the transformation
• Specific training programs to enhance curriculum implementation	6. Institute training on the job 13. Institute a vigorous program of training and self improvement for everyone
• A curriculum that is monitored by central office personnel and building principals	7. Adopt and institute leadership
• Teacher and administrator responsiveness to school board policies, currently and over time	1. Create constancy of purpose for improvement of product and service

* No corresponding point; see text

Standard Four: Feedback

Standard Four of the curriculum audit, the feedback standard, provides for the use of assessment data to adjust, improve, or terminate ineffective practices or programs. Table 5 shows the Standard Four criteria and Deming's points.

Deming's point number three, **cease dependence on mass inspection to achieve quality**, coincides with the first and third criteria. It also coincides with auditors' recommendations to do away with those norm referenced tests that are not state mandated. The auditors have not recommended doing away completely with norm referenced tests, since they do believe the local system must be in compliance with state mandates. However, auditors would encourage districts to lobby to get rid of the tests for the purposes currently used. When asked his opinion about state mandated tests, Deming said, "Just don't give them" (1992e). "Ranking people is a farce," Deming says; yet we usually rank students and award those at the top while punishing those at the bottom. What are thought to be differences in performance are actually attributable to the system in most cases. Deming says, "Only trivial things can be measured...Raw totals and not customer needs is what concerns management" (1992a).

The auditors recommend strongly to school systems to use formative data to improve the system. Daily and weekly diagnostic measures are needed to improve instruction for students. Criterion referenced tests aligned with curricular objectives are urged by auditors for ongoing feedback. This also relates to Deming's ideas of continual improvement and constancy of purpose, to reduce in system variability (Deming, 1992a). Graduate follow-up studies should include questions about customer, or community, satisfaction.

Both the audit and quality perspectives have as a major premise the use of feedback to improve the process which in turn affects the results (student learning). Audit recommendations often include ongoing diagnostic use of student assessment devices to influence daily instruction. Deming's beliefs on variation are in alignment with this audit standard. Use of data to work on the system, not the worker (in this case, the student as well as the teacher).

Finally, Deming's twelfth point, **break down barriers that rob people of pride of workmanship; eliminate the annual rating or merit system,** relates to the use of a database to compare strengths and weakness of various programs and program alternatives. This point also suggests that auditors recommend against teacher rating and ranking, merit pay, and grades for students. Data should be used to improve the program, or system, rather than to differentiate between and among students and staff. This is one of the most difficult points to consider in applying quality principles to schools because of constraints of state laws and public pressure. However, most states allow districts to apply for waivers to state regulations.

Deming does not have an explicit point that relates to the final criterion, which refers to a database to modify or terminate ineffective educational programs, but it would be safe to assume that if attention were given at the system, or program, level, that ineffective programs or practices would be terminated.

Table 5 Standard Four: Feedback and Deming's Points	
Audit Criterion	**Deming's Points**
• A timely and relevant data base upon which to analyze important trends in the instructional program	3. Cease dependence on mass inspection to achieve quality 5. Improve constantly and forever every process for planning, production, and service
• A vehicle to examine how well programs are actually producing desired learner results	5. Improve constantly and forever every process for planning, production, and service
• A way to provide feedback to the teaching staff regarding how classroom instruction can become more effective	3. Cease dependence on mass inspection to achieve quality 5. Improve constantly and forever every process for planning, production, and service
• A data base to compare the strengths and weaknesses of various programs and program alternatives	12. Break down barriers that rob people of pride of workmanship. Eliminate the annual rating or merit system
• A data base to modify or terminate ineffective educational programs	

Standard Five: Productivity

Standard Five of the curriculum audit, the productivity standard, refers to the congruence between curriculum outcomes and costs, the means to attain better results over time, and demonstration of planned intervention to raise pupil performance.

Deming's first point, **create constancy of purpose for improvement of product and service**, relates to all the criteria in this standard. Deming advises going upstream to improve quality. The audit sees productivity as the overriding purpose of good curriculum management.

Deming's point number four is **end the practice of awarding business on the basis of price tag alone; instead, minimize total cost by working with a single supplier.** The audit standard is concerned with improving results within existing financial parameters. Deming's advice to work with a single supplier has the potential to actually reduce costs. One of the authors asked Dr. Deming how a school district could get around state laws requiring districts to contract with the lowest bidder. He replied that it isn't necessary to get around the law; rather, that use needs to be calculated into prices, and districts would thereby be able to work with a single supplier. For instance, if a district purchased high quality tires for its school buses, more costly than those of lesser quality, wear would be calculated into the price, thereby potentially making the higher quality less expensive ones less expensive to use (1992e).

Point number five, **improve constantly and forever every process for planning, production, and service**, also refers to all the audit criteria of Standard Five, which has a strong relationship to the quality movement. The purpose of the audit is to increase productivity over time through continual improvement practices.

Point fourteen, **put everybody in the company to work to accomplish the transformation**, relates to the final Standard Five criterion regarding planned interventions to raise pupil performance.

Table 6
Standard Five: Productivity and Deming's Points

Audit Criterion	Deming's Points
• Planned and actual congruence among curriculum objectives, results, and financial costs	1. Create constancy of purpose for improvement of product and service 4. End the practice of awarding business on the basis of price tag alone. Instead, minimize total cost by working with a single supplier 5. Improve constantly and forever every process for planning, production, and service
• Specific means that have been selected or modified and implemented to attain better results in the schools over a specified time period	1. Create constancy of purpose for improvement of product and service 4. End the practice of awarding business on the basis of price tag alone. Instead, minimize total cost by working with a single supplier 5. Improve constantly and forever every process for planning, production, and service
• Demonstration of planned interventions to raise pupil performance over time within the same financial parameters	1. Create constancy of purpose for improvement of product and service 4. End the practice of awarding business on the basis of price tag alone. Instead, minimize total cost by working with a single supplier 5. Improve constantly and forever every process for planning, production, and service 14. Put everybody in the company to work to accomplish the transformation

Summary of the Second Prong

There is considerable overlap of Deming's principles for system transformation and the Curriculum Audit standards and criteria. Ten of his Fourteen Points relate to audit criteria. Most of these points, as in the first prong of this article, pertain to purpose and structure of the organization.

The remaining points, numbers 8, 9, 10, and 11, do not appear to relate to existing curriculum audit criteria. As with the first prong, these are primarily concerned with the way in which management should relate to workers to achieve maximum intrinsically-motivated results. Were the auditors to use the curriculum audit as a vehicle to turn a school system into a quality school system, top level management should:

- **Drive out fear.** That would mean empowering and enabling all those in the system to have input into the decision-making process as it involves student learning without being afraid of doing so. It would also preclude schools from awarding raises based on student test scores.

- **Break down barriers between staff areas.** That would mean creating cross disciplinary teams, and having everyone work together to improve student learning.

- **Eliminate slogans, exhortations, and targets for the work force.** Although the audit teams often see all kinds of slogans and posters--both those that encourage students to do well and those that poke fun at school work, the standards do not address them except to the extent that they are part of the "hidden curriculum," which means they are seen as positive if they are

positive and negative if they are negative. Deming's point would suggest that slogans and exhortations imposed from the top do not serve people well.

Were this point applied to the audit process, the auditors suggest that posters should, rather, explain to everyone what the administration is doing to provide better materials, supplies, maintenance, supervision, and/or statistical aids to improve quality and productivity.

Another significant part of this point refers to targets for the work force. Arbitrary goals do not suggest a method for implementation. Determining teacher raises based on students' test scores also causes fear, as described earlier.

Deming's reference to targets are criteria for staff to meet, while targets in the curriculum audit concern areas of need as they relate to process, so they are not in disagreement, as they are used in different contexts. These points suggest that school district goals should focus on continual improvement of education.

- **Eliminate numerical quotas for the work force and numerical goals for management.** School systems sometimes award teacher raises based on student scores on norm-referenced, standardized tests, as discussed under Standard Four. The earlier discussion concerns not giving the tests at all. This point suggests not establishing the quotas, regardless of which data were used for comparison.

Summary and Recommendations

The two-pronged analysis of the curriculum audit in quality terms revealed that, while there is significant overlap between the curriculum audit and quality management principles in some areas, there are other areas that are not explicitly addressed but, rather, implicit in the context of the audit. As auditors suggest changes to schools, they need to be aware of these implicit criteria and their relation to quality principles. When a school district it audited, the audit team creates findings that show where the district falls short of meeting the five standards. Then the auditors make recommendations as to how it might go about meeting them.

The authors found, in their analyses of quality principles posed by Downey's Quality Fit Framework and of Deming's four areas of Profound Knowledge and the Fourteen Points with the audit criteria, that, were the audit process to be conducted with quality in mind, there are other criteria and subsequent recommendations that might be considered. The questions as to where these criteria might fit into the audit framework deserves further study. Perhaps the criteria under each standard might be expanded; perhaps a new standard might be created. That standard might be called the relationship standard.

Further recommendations the authors pose are a result of numerous lectures and private conversations with Dr. Deming. We are extremely grateful to Dr. Deming for the help he has provided in understanding the application of his principles to the education system.

Table 7 shows a summary of those areas where the authors did not find strong overlap, references the prong where the issue was discussed, and suggests a standard number and/or shows an "R" to indicate it might belong to a

new relationship standard or needs to be included explicitly under the existing five standards. When an "L" shows in the prong column, it indicates that the idea came from Dr. Deming's lectures. A "P" refers to private conversations with Dr. Deming during 1992. These criteria have not all been discussed in detail in this article, but they certainly bear consideration as school personnel begin to understand quality and as proponents of the Curriculum Audit continue to improve the process of examining school districts.

Note: The authors are extremely grateful to Dr. W. Edwards Deming and to Dr. Fenwick English for their assistance in helping them understand their theories and for reviewing this manuscript and improving it.

Table 7
Summary of Possible Criteria to Make Explicit in the Curriculum Audit

Quality Criteria	Prong	Standard
Create a shared sense of mission	1	1
Create an integrated webbed structure	1	1
Mobilize workers	1	1,R
Manage relationships	1,L	R
Encourage collaboration	1	R
Create a sense of shared values and beliefs	1	1,R
Understand what motivates workers	1,L	R,3
Understand that failures are attributable to the system	1,L	4,R
Use the plan-do-study-act (PDSA) cycle	2,L	4
Create flow diagrams to show how the work is connected	2,L	1,4
Drive out fear	2	R,1,3
Break down barriers between staff areas	2	R,1
Eliminate slogans, exhortations, and targets	2	R,1
Break down barriers that rob people of pride of workmanship. Eliminate the annual rating or merit system	2	R
Eliminate numerical quotas and goals, ranking, rating, and grades	2,P	3,4
Institute training and education for everyone	2,L,P	3,R
Eliminate the norm-referenced testing program	2,P	4
Work with a single supplier	2,P	5
Eliminate unnecessary paperwork	2	R
Teach theory to everyone	L,P	1,3
Allow freedom, intrinsic motivation	L	R,3
Optimize system by encouraging cooperation	L	R,1,3
Help students see how their learning fits	L	R,2
Put more effort into early stages of learning; research into theory	L	2
Allow freedom for teachers, students, staff to learn, create, and innovate	L	R,3

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